

What is claimed is:

1. A target tracking method comprising:
optically tracking a target within a first image;
irradiating a light source within the first image;
5 stabilizing the first image;
comparing the irradiated light source with a portion of a starfield pattern within
the second image; and
determining inertial reference information of the tracked object based on the
comparison.
- 10 2. The method of Claim 1, wherein the irradiated light source is referenced to the
optically tracked target.
3. The method of Claim 1, wherein the irradiated light source is a modulated optical
beam.
4. The method of Claim 1, wherein determining inertial reference information
15 includes further determining inertial reference information based on platform information.
5. The method of Claim 4, wherein the platform is a satellite.
6. The method of Claim 4, wherein the platform is an aircraft.
7. The method of Claim 4, wherein the platform is a ground based system.
8. The method of Claim 7, wherein the ground based system is a vehicle.
- 20 9. A targeting platform comprising:
a target tracking system including:
a database for storing starfield information;
an optical beam source configured to illuminate one or more optical beam
pulses;
25 a first camera system configured to track an object and record the tracked
object;
a second camera system configured to stabilize a tracking image received
by a portion of the first camera system and record the stabilized image
that includes the one or more optical beam pulses; and

a processor coupled to the database, the optical beam source, and the first and second camera systems, the processor including:

a first component configured to instruct the first camera system to track the object based on recordation of the tracked object;

a second component configured to instruct the second camera system to stabilize the tracking image based on the instructions sent to the first camera system; and

a third component configured to determine inertial reference information of the tracked object based on the stabilized image and starfield information associated with the stabilized image.

10. The platform of Claim 9, further comprising:

one or more platform information sources coupled to the target tracking system, the one or more platform information sources being configured to send platform information to the target tracking system,

wherein the third component is configured to further determine inertial reference information based on platform information.

11. The platform of Claim 9, wherein the first camera system includes:

a first fast steering mirror configured to track the object based on instructions from the first component; and

a first camera configured to record an image reflected by the fast steering mirror and send the recorded image to the first component.

12. The platform of Claim 11, wherein the second camera system includes:

a second fast steering mirror configured to stabilize the image reflected by the first fast steering mirror based on instructions sent from the second component; and

a second camera configured to record an image reflected by the second fast steering mirror and send the recorded image to the third component.

13. The platform of Claim 9, wherein the platform is a satellite.

14. The platform of Claim 9, wherein the platform is an aircraft.

15. The platform of Claim 9, wherein the platform is a ground based system.

16. The platform of Claim 15, wherein the ground based system is a vehicle.

17. A target tracking system comprising:

a database for storing starfield information;

an optical beam source configured to illuminate one or more optical beam pulses;

a first camera system configured to track an object and record the tracked object;

a second camera system configured to stabilize a tracking image received by a portion of the first camera system and record the stabilized image that includes the one or more optical beam pulses; and

a processor coupled to the database, the optical beam source, and the first and second camera systems, the processor including:

a first component configured to instruct the first camera system to track the object based on recordation of the tracked object;

a second component configured to instruct the second camera system to stabilize the tracking image based on the instructions sent to the first camera system; and

a third component configured to determine inertial reference information of the tracked object based on the stabilized image and starfield information associated with the stabilized image.

18. The system of Claim 17, wherein the third component is configured to further determine inertial reference information based on received platform information.

19. The system of Claim 17, wherein the first camera system includes:

a first fast steering mirror configured to track the object based on instructions from the first component; and

a first camera configured to record an image reflected by the fast steering mirror and send the recorded image to the first component.

20. The system of Claim 19, wherein the second camera system includes:

a second fast steering mirror configured to stabilize the image reflected by the first fast steering mirror based on instructions sent from the second component; and

a second camera configured to record an image reflected by the second fast steering mirror and send the recorded image to the third component.

21. A target tracking system comprising:

means for optically tracking a target within a first image;

means for irradiating a light source within the first image;

means for stabilizing the first image;
means for comparing the irradiated light source with a portion of a starfield
pattern within the second image; and
means for determining inertial reference information of the tracked object based
on the comparison.

22. The system of Claim 21, wherein the irradiated light source is referenced to the
optically tracked target.

23. The system of Claim 21, wherein the irradiated light source is a modulated optical
beam.

24. The system of Claim 21, wherein the means for determining inertial reference
information includes means for determining inertial reference information based on platform
information.

25. The system of Claim 24, wherein the platform is a satellite.

26. The system of Claim 24, wherein the platform is an aircraft.

27. The system of Claim 24, wherein the platform is a ground based system.

28. The system of Claim 27, wherein the ground based system